IN THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1-37. (Canceled).

38. (Currently Amended) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor;

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal; and ~~The microprocessor of claim 37 further comprising:~~

a fail-safe thermal sensor ~~generating~~ to generate a fail-safe interrupt ~~signal if the~~ signal in response to the microprocessor temperature ~~exceeds~~ exceeding a fail-safe threshold temperature, wherein the processor unit is halted in response to the fail-safe interrupt signal.

39. (Currently Amended) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a

microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal; ~~The microprocessor of claim 37~~ wherein the clock circuitry further comprises a phase locked loop.

40. (Currently Amended) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal;

~~The microprocessor of claim 37~~ wherein the thermal sensor comprises[[:]]

a current source;

a voltage reference coupled to the current source to provide a bandgap reference voltage, wherein the bandgap reference voltage is substantially constant over a range of temperatures;

programmable circuitry ~~providing~~ to provide an output voltage varying with the microprocessor temperature in accordance with the register value; and

a comparator, wherein the comparator ~~generates~~ is to generate the first interrupt ~~signal if a~~ signal in response to a difference between the output voltage and the bandgap reference voltage ~~indicates~~ indicating that the threshold temperature has been exceeded.

41. (Currently Amended) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal;

~~The microprocessor of claim 40~~ wherein the programmable circuitry further comprises[[:]]

a transistor coupled to the current source to provide the output voltage, a gain ratio of the output voltage to a junction voltage of the transistor to be controlled by a transistor bias, wherein the junction voltage ~~varies~~ is to vary in accordance with a junction temperature of the transistor, the junction temperature ~~corresponding~~ is to correspond to the microprocessor temperature; and

a bias circuit ~~providing~~ to provide the transistor bias to control the gain ratio, wherein the output voltage ~~varies~~ is to vary with the microprocessor temperature in accordance with the register value.

42. (Currently Amended) A microprocessor comprising:

a register is to store a register value corresponding to a threshold temperature;

a programmable thermal sensor is to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal;

~~The microprocessor of claim 41~~ wherein the bias circuit further comprises binary weighted resistors.

43. (Cancelled)

44. (Currently Amended) The computer system of claim [[43]] 48, wherein the active cooling device comprises a fan.

45. (Currently Amended) The computer system of claim 44 further comprising:

clock circuitry ~~for providing~~ to provide a clock signal for the microprocessor, wherein a frequency of the clock signal is reduced in response to the first interrupt signal.

46. (Currently Amended) A computer system comprising:

an active cooling device;

a microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature,

wherein the active cooling device is to be activated in response to the interrupt signal, and

~~The computer system of claim 45 wherein~~ the clock circuitry further comprises[[:]]

a first clock;

a frequency divider coupled to the first clock to provide the clock signal, the frequency divider ~~reducing~~ to reduce a frequency of the clock signal in response to the interrupt signal; and

a second clock circuit coupled to provide the clock signal to the microprocessor.

47. (Currently Amended) A computer system comprising:

an active cooling device;

a microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature,

wherein the active cooling device is to be activated in response to the interrupt signal, and

~~The computer system of claim 46 wherein~~ the microprocessor further comprises[[:]]

a processor unit coupled to the second clock circuit, wherein the processor unit ~~executes~~ is to execute instructions to vary the frequency of the clock signal from the second clock circuit in response to the first interrupt signal.

48. (Previously Presented) A computer system comprising:

an active cooling device;

a microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature,

wherein the active cooling device is to be activated in response to the interrupt signal, and

~~The computer system of claim 47 wherein~~ the processor unit ~~programs~~ is to program the register with another register value corresponding to another threshold temperature in response to the first interrupt signal.

49. (Cancelled)

50. (Currently Amended) A microprocessor-implemented method of controlling the temperature of a microprocessor, comprising:

a) generating a temperature signal within the microprocessor indicative of the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal in response to the temperature signal indicating that the first threshold temperature level has been exceeded;

d) decreasing a microprocessor clock frequency in response to the interrupt signal;

~~The method of claim 49 further comprising the steps of:~~

e) comparing the temperature signal with a second threshold temperature level, wherein the second threshold temperature level represents a fail-safe temperature; and

f) halting the ~~microprocessor, if the~~ microprocessor, in response to the temperature signal ~~indicates~~ indicating that the second threshold temperature level has been exceeded.

51. (Cancelled)

52. (Currently Amended) A microprocessor-implemented method of controlling the temperature of a microprocessor, comprising:

a) generating a temperature signal within the microprocessor corresponding to the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal in response to the temperature signal indicating that the first threshold temperature level has been exceeded; and

d) activating an active cooling device to decrease the microprocessor temperature in response to the interrupt signal;

~~The method of claim 51~~ wherein the active cooling device is a fan.

53. (Currently Amended) A microprocessor-implemented method of controlling the temperature of a microprocessor, comprising:

a) generating a temperature signal within the microprocessor corresponding to the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal in response to the temperature signal indicating that the first threshold temperature level has been exceeded;

d) activating an active cooling device to decrease the microprocessor temperature in response to the interrupt signal;

~~The method of claim 51 further comprising the steps of:~~

e) comparing the temperature signal with a second threshold temperature level, wherein the second threshold temperature level represents a fail-safe temperature; and

f) halting the ~~microprocessor, if the~~ microprocessor, in response to the temperature signal ~~indicates~~ indicating that the second threshold temperature level has been exceeded.

54-60. (Canceled):